314 Indeed scavenging, that is to say the gathering of forest products, hunting and fishing, is all that is needed besides rice and maize to supply the day to day needs of the native and even provide him with a comparatively important basis for trade.

Forest Products

1. Benzoin (Khab-Niane).

314 824 563 Benzoin is extracted from the tree called Styrax benzoin, by means of incisions made on the trunk. The benzoin trees (Kok-Khab-Niane) are localized in Upper Tran-Ninh, the south of the Hua-Pahn and the north of the province of Luang-Prabang. They are not cultivated in any way. The resin or gum is harvested at certain times of the year, generally by the Khas, at the foot of the trees and along the trunk, where it coagulates in masses or tears.

Benzoin is collected in its natural state, that is to say in tears of various sizes and in breakages. In the production centers it is separated into three grades: large and medium tears, medium and small tears, and small pieces and breakages. In the transit markets these three grades are sorted and screened and once more divided into six kinds or types, which are: large tears, medium tears, small tears, mixed large, mixed medium, and finally tiny fragments and dust.

[431] A few years ago a chemical process was [329] discovered, it would seem, for extracting certain of the aromatic alkaloids contained in benzoin from coal, and the market value of this product suddenly dropped by more than sixty percent. At the present time, depending 435 on the grade, the market price in Luang-Prabang is from 90 to 115 francs per hundred kilograms (1), in Nong-Khay from 100 to 135

(1) We have deemed it preferable to give the price in francs and per hundred kilograms, since the reader may not be familiar with Laotian weights and currency.

788 francs, and in Korat from 120 to 160 francs.

314 439 Part of the benzoin production is consumed locally in the manufacture of sticks of incense for use in worship. All the rest is exported to Bangkok and from there to Europe. A very small proportion is sent to Tonkin by way of the Black River. Upon its arrival in Bangkok, benzoin from Laos is worth twice as much as in Luang-Prabang.

824 314 ### 2. Crimson lake or stick-lac (Khang-Deng).

This gum is produced by an insect of the "cochineal" type, the

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Coccus lacca, which secretes the lac to envelop its larvae.

In trade it appears in the form of half-cylindrical fragments, in breakages (seed-lac), or else adhering to the branches of the tree on which it formed. The latter is lac on sticks, whence the English name stick-lac by which it is known in Far Eastern trading circles (2).

(2) Lac in its most widespread form--lac in shells (shellac)--is not found in Laos. It can easily be produced by boiling the preceding types in alkaline water.

This product is harvested by scavenging from trees which were seeded long ago and are scattered throughout the brush, and also by regular cultivation from a triennial tree, as will be seen below. The principal varieties of trees on which lac is found are the Ficus, the butées, the Croton, the Mimosa and the Acacia.

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There are three kinds of lac: bright-colored lac (which colors a moistened finger) in whole pieces, lac on wood and brown cellular lac in more or less broken fragments. Throughout the country, however, it is sold mixed, and only at the transit markets are the three kinds separated.

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[330] The price per hundred kilograms is from 35 to 42 francs at Luang-Prabang, from 45 to 48 francs at Pak-Lay, from 47 to 50 francs at Nong-Khay, 42 francs at Khong and Bassac, 62 francs at Pnom-Penh and Cholen, and from 72 to 85 francs at Korat.

Crimson lake is used for dyeing as well as in the preparation of certain colors and varnishes with an alcohol base. A small proportion remains in the country, but the greater part is exported.

3. Cardamom (Mak-Neng).

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Cardamom is the fruit of the plant Ellateria cardamomum which grows in the forests but which may be cultivated, as is the case on the plateau of the Bolovens in Laos and in the region of Pursat in Cambodia. The variety common to all parts of Laos is the great cardamom or bastard cardamom, while that cultivated in Cambodia is the true cardamom or small cardamom, much superior to the first in quality and value.

The plant grows best in the humid forests, and is harvested in August or September. The plant has vast numbers of light seeds, and it takes about eighty or a hundred thousand seeds to make up the weight of one "mune" (about twelve kilograms). The price per

[435] The price per hundred kilograms is from 50 to 54 francs in Luang-Prabang, 62 francs in Pak-Lay, from 62 to 70 francs in Nong-Khay, 50 francs in Cammon, from 75 to 83 francs in Song-Khone, from 66 to 87 francs in Saravane, from 70 to 83 francs in Bassac, from 83 to 95 francs in Khong, 58 francs in Attopeu, from 50 to 83 francs in Stung-Treng, 133 francs in Pnom-Penh, 140 francs in Cholen (1) and from 80 to 120 francs in

(1) At this market cardamom from Pursat brings from 625 to 830 francs per hundred kilograms.

Korat.

4. Cinnamon (Cinnamomum zeylanicum. Kai-Hom in Laotian).

The cinnamon tree must have been cultivated at one time in the territory of Vien-Tiane. Then the inhabitants were driven out as a result of foreign incursions and abandoned their gardens, which were gradually invaded by brush. The harvesting of cinnamon has since become a scavenging operation without any form of cultivation. For several years now, doubtless in consequence of the many requests which were made when the Customs service tried to establish a monopoly of this product in Annam, [331] [Illustration] [332] [Blank page] [333] the inhabitants have once more begun to maintain the cinnamon trees and to give them some attention. Plantations have even been started, and this propitious initiative should be encouraged.

5. Indigo (Kok-Kam and Kok-Hom, depending on whether the Indigofera tinctoria or the Indigofera anil is designated).

These two plants are not always scavenging products, since the greater part of Laotian indigo comes from crops grown on the banks of the Mekong and its chief tributaries.

There is also an indigo-bearing liana which grows wild. The Laotians call this "Bouok-Khua".

In Laos the preparation of indigo is extremely simple. The fresh leaves and stalks of the different varieties of indigo plants are put to soak in wooden vats containing water and an acid element, usually the acid of lemons or limes. After a certain time the leaves are removed, then lime is precipitated in the water and the mixture is violently stirred. The lime fixes the dye and is deposited at the bottom of the vats, which are exposed to the air. When the clear water which rises to the surface has been completely evaporated, a hardened mass which is the indigo is left at the bottom of the vat. This product is not exported, but serves only for local consumption. Its price varies between 12 and 15 francs per hundred kilograms.

Its price varies between 12 and 15 francs per hundred kilograms.

6. Catechu (Sisiet).

Catechu is produced from a decoction of the bark of two varieties of trees, the catechu acacia and the leafy butée.

This product, which is used in making the national masticatory together with betel, betel nuts and lime, is consumed, in the large centers of Upper Laos, in the form of a dry residue obtained from a decoction of the bark. Generally, however, it is the bark itself which is consumed after it has been broken up into small pieces.

Natural sisiet takes the form of shreds of bark about a cubit (.45 meter) long by four centimeters wide and one centimeter thick. The shreds are tied together in packs of twenty-five or fifty, depending on the region.

The whole production is consumed locally. The natives [334] go into the forest at points where suitable trees are to be found, bundle up the pieces and load them on great rafts which go down from Pak-Lay and Vien-Tiane to Bassac and even to Khong.

At Pak-Lay sisiet is worth only 7 francs and 50 centimes per hundred pieces, but it naturally costs more the further away one goes from the centers of production.

7. Curcuma (Khi-Mine).

This plant, of the Zingiberaceae family, has a rhizome which contains an orange-yellow coloring matter used for dyeing silk and cotton.

Sometimes the inhabitants (chiefly the women and children) rub their whole body with curcuma scrapings after a bath. The application of curcuma to the wet skin, which acquires a light yellow color, is said by the natives to ward off mosquitoes and keep the skin fresh.

Up to the present time this product has not formed the basis of any foreign trade. It is sold in small amounts on the markets of Laos.

8. Ginger.

The ginger which is called "Mak-Khing" in Laotian is the Zingiber officinale or gray ginger. Used as a condiment by the entire population, this product does not enter into trade. Its price varies between 12 francs and fifty centimes and 16 francs and fifty centimes per hundred kilograms.

9. Roucou.

The roucou, or fruit of the Roucouyer Bixia, is called "Kano-Mak-Soum-Phos" in Laotian. Literally, this means Seed of an acidulous mountain fruit. It is used to make red and orange dyes

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386 when mixed with curcuma. The trees are found in the forest, and sometimes in gardens.

10. Yams.

262 The yam is an edible tubercle of the Dioscorea family. It is
241 represented by two varieties, the white and the black, which are called "Mane-Phuek-Khao" and "Mane-Phuek-Dam" in Laotian. These tubercles are the main standby when there is a scarcity of rice and [335] maize, but in ordinary times they are used only to supplement the usual diet.

11. Taro or cush-cush (Mane-Pa).

Taro is also a food plant of the Aroïdées caladiées genus (Caladium esculentum). Like the yam, it is one of the most useful edible tubercles in times of famine.

12. Medicinal plants.

824 Designated by the generic name "Ya" in Laotian, these plants
278 are represented by special types of orchids, roots, bark, berries, leaves and even pieces of wood of different kinds, the whole forming an assortment of medicaments.

[438] The Khas are the ones who collect these various products from the depths of the forests, and they trade them either to Chinese or to Laotians for money or other goods.

[435] Certain of these plants and barks are used by the Laotians while others, such as the leaves from orchid plants, for example, are purchased by Chinese merchants at prices which vary between 33 and 62 francs per hundred kilograms.

13. Cloves.

The clove tree (Caryophyllus aromaticus. Kane-Phou in Laotian) is quite scarce in Laos. Cloves are mixed with various ingredients in masticatories or are taken as medicine.

Cultivation of the clove tree ought to be developed in Laos because of the high value of its flowers which, when dried on the tree, constitute the cloves of commerce.

14. Beeswax (Phung).

222 Beeswax is much sought-after in Laos, where a great deal of it is
[231] consumed. It is a scavenging product par excellence since, except in
314 the Sib-Song-Pahn-Na, the inhabitants do not practice apiculture and are content to go into the forest and look for honeycombs in order to extract the wax. The latter is used for domestic needs and for worship
[438] ceremonies. It also forms the basis of quite an important trade.

314 The wax is not of uniform quality in Laos, but varies in color and texture depending on the region, the type of bees [336] which produce it, and also on the flowers on which the latter feed.

In this land there are hive hunters who have a rare skill and an extraordinary flair. They are able to find wild hives in the confusion of the forest foliage, in hollow trunks and in rocky crags where no one else could. The methods used to capture the swarms of bees and their hives differ little from those in use in Europe, and include noise, music and smoke.

[789] The Laotians claim that some bee hunters are able to get rid of the swarms of bees by attracting their queen by means of the sound of a kind of flageolet and by pronouncing certain cabalistic words.

435 The price of wax is quite high. A hundred kilograms cost 250 francs in Luang-Prabang, 219 francs in Nong-Khay, 290 francs in Cammon, 300 francs in Song-Khone and Saravane, 333 francs in Bassac, 208 francs in Attopeu, 312 francs in Stung-Treng, 500 francs in Korat, 250 francs in Pnom-Penh, and 300 francs in Cholen.

15. Rattan (Vai).

314 The rattan is a palm tree of the genus Calamus rudentum and
285 Calamus petracus. There are several types in Laos, which are used in accordance with their particular qualities.

The rattan industry is still in its early stages. A few Kha tribes of southern Laos traffic in rattan and supply the needs of local consumption, either in the form of crude rattan delivered in bundles, or in the form of mats and baskets, at a price of five francs per thousand or about sixty kilograms. It is present in great abundance throughout the whole land, and in northern Laos is even used for trade with Siam, which produces little rattan.

It is to be hoped that among the samples sent from Laos to France there will be some good ones which can be used abroad in the manufacture of all the wickerwork and esparto articles whose consumption is constantly increasing. This would provide an appreciable source of revenue for the land.

16. Bamboo.

313 There are some twenty varieties of bamboo. All [337] [Illustration] [338] [Blank page] [339] except one of these grow wild, the exception being the golden bamboo (Mai-So-Kham), which is chiefly cultivated in the enclosures of pagodas.

The following description of the many uses of bamboo is taken from the interesting work by Mme. Massieu:

314 plentiful by half than the first, yields a clear, sinewy, dry and elastic
824 rubber in threads and sheets.

Rubber from the second harvest has been submitted to competent individuals for examination, and it seems that it would bring a price of 8 to 10 francs per kilogram on the European market.

435 In April 1900 the purchase price of this product per hundred kilo-
314 grams was 137 francs in Vien-Tiane, from 166 to 208 francs in Muong-Son, 290 francs in Cho-Bo (Tonkin) and 550 francs in Vinh (Annam). Its resale price was 625 francs in Saigon, 700 francs in Singapore and from 800 to 1000 francs in Europe (1).

(1) This refers only to first grade rubber.

These figures suffice to show that Laotian rubber is a choice product in high demand, and a first-rate trade commodity holding the promise of sizeable profits.

439 The total amount of rubber exported from Laos in 1899 through
314 the ports of Tonkin, Annam and Cochinchina is estimated at some fifty tons. For 1900 the figure would appear to be about eight times larger (2). This trade has only developed in Laos in the last two or

(2) See Appendix XXII.

three years, but now that the initial impulse has been given and the people are beginning to harvest the latex which they used to scorn because there were no outlets for it, the traffic will not cease to increase from one year to the next, since rubber finds an increasing demand on the European market.

Although the lianas are extremely plentiful in the Laotian forests, care should now be taken to spare them as they are exploited and to increase the number of plants so as to avoid any shortages in the future.

314 18. Pine resin (Khi-Kok-Phek or Niang-Phek).

Pine resin is used in Laos only when mixed with crimson lake. It is used for making a varnish and certain mastic compounds. It has a very low value, never more than 20 francs per hundred kilograms and [342] sometimes as low as 6 francs. None of this product is exported. It would be easy to introduce the regular cultivation of pines and the harvesting of their resin into the land, if sufficiently remunerative outlets were opened up.

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19. Miscellaneous resins.

Several trees, such as the "Kok-Mai-Niang, Kok-Mai-Tabeng, [Illustration here] Kok-Mai-Sak" (1), etc., yield an oleo-resin which,

(1) See Appendix XX.

when mixed with paddy husks, is used to make torches and a siccative, shiny extract which is called "Nam-Mane-Niang," and again a kind of pitch (Khi-Si) which is used to caulk pirogues and to smear various basketwork receptacles so as to make them watertight. It is similar to damarine.

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The production of these resins is limited to local needs.

20. Black lacquer.

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The black lacquer of Laos is a natural black varnish, thick and [343] solid, which is called "Nam-Kieng." It is secreted by the "Kok-Mai-Nam-Kieng."

Nam-Kieng is used to lacquer racing pirogues, elephant palanquins, pagoda columns and statues, frames, receptacles of different kinds, sword sheaths, etc. The lacquer producing trees grow only in certain localities, and the varnish is not exported. Its price varies throughout the land between 62 and 75 francs per hundred kilograms.

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It would be of interest to identify this lacquer with that of Japan, and to study the question as to whether it might not be possible to increase the number of trees which produce it with a view towards making it the basis of an export trade, at least to the countries bordering on Laos.

21. Cunao (the mock gambier, Mak-Soua in Laotian).

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The cunao is a brownish tubercle used instead of catechu, the color of which it has, for dyeing cloth. It is found in Cammon, in a part of the Hua-Pahn and on the right bank of the Nam-Hou. This product is bought mainly by Annamites and Chinese, who use it in Annam and Tonkin for dyeing the peasants' work clothes.

000 to a point where it is perfectly docile.

231 435 The sale price of elephants varies with their size, their sex, their age, and according to whether or not they have tusks and according to the quality and size of these latter. It also varies with the region.

At Outhai-Thani (Luang-Prabang) an elephant costs from 1,500 to 3,000 francs, and the cost is about the same at Vien-Tiane. In Lower Laos the price varies from 750 to 1,200 francs.

When an elephant dies it still leaves highly valuable remains, especially ivory.

237 438 435 1. Ivory.

A hundred kilograms of ivory sells for 1,800 francs at Outhai-Thani (Luang-Prabang), from 935 to 1,770 francs in Nong-Khay, from 750 to 1,250 francs in Song-Khone, from 750 to 1,670 francs in Saravane, from 1,000 to 1,670 francs in Bassac and from 1,500 to 1,670 francs in Khong, Stung-Treng and Attopeu. Its average cost in Cholen (Cochinchina) is 2,500 francs per hundred kilograms.

2. Bones.

The price of elephant bones is generally from 12 francs 50 centimes to 15 francs per hundred kilograms.

3. Hides.

Elephant hides cost from 60 to 70 francs per hundred kilograms.

The remains of other elephants furnish the markets of Laos with the following products: rhinoceros horns and hides, horns and hides from buffalo and oxen, horns and hides from all the deer tribe, hides, talons and bones from the cat family, bear and otter pelts, scales from anteaters, tortoises and caymans, etc. To this list should be added snake venom, bear gall and soft hartshorn, which are regarded as specific remedies against certain diseases.

The prices of some of these products are as follows:

Rhinoceros horns	111 to 137 francs per kilogram
Rhinoceros hides	60 to 70 francs per 100 kilograms
Soft hartshorn	1,666 to 2,200 francs per 100 kilograms or 18 to 40 francs per pair
[349] Horns of stags, elk and bucks (hard)	25 to 75 francs per 100 kilograms
Hides of stags, elk, bucks, goats	37 to 83 " " " "
Wild buffalo horns	50 to 60 " " " "
Wild buffalo hides	46 to 50 " " " "
Ox horns	50 to 58 " " " "

Ox hides	58 to 65 francs per 100 kilograms
Bones of tigers and other cats	58 to 75 " " " "
Pelts of tigers, panthers and other large cats	3 francs to 12 francs and 50 centimes apiece
Anteater scales (without the skin)	50 to 72 francs per 100 kilograms
Anteater hides (with scales)	46 to 50 " " " "
Skins of various monkeys	83 to 88 " " " "
Tortoise shells	37 francs and 50 centimes per 100 kilograms.

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Fishing, preserved fish

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Laos, with its extensive hydrological network and its watercourses of all sizes, is a fishing land par excellence. We have already noted the chief varieties of fish which populate its rivers, and have seen that most of them are represented by large-sized specimens.

Since the produce of fishing makes a considerable contribution to the food supply of the inhabitants, it has been necessary to create devices and combine various means for capturing this prey.

The methods, primitive at first, have been increasingly perfected, and each one has been modified so that it is adapted to some particular feature either of the watercourses or of the fish.

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The devices used today are wholly made by the inhabitants. They vary greatly in form and--the fact is worth noting--are much like those used in Europe. Indeed, the floating line is common, but in its most rudimentary form, with a thorn for a hook and then the ground-line and long-line. There are also nets in great abundance, and they are identical with the ones found among our fishermen. The most common ones are the seine, the cast-net, the square dipping-net, the shrimping-net, the hoop-net, the landing-net and the large trammel. All this equipment is supplemented with bottles, [350] single and double bow-nets and traps. The Laotians also build large barrages across watercourses and provide them with corridors leading to bow-nets or hoop-nets.

Hiding places in the form of fixed huts on the watercourses are used for spear fishing. A light in these huts attracts the fish and the native, who is armed with a hardwood fork, spears it as soon as it comes within range. [Illustration here]

149: Reinach--258 G-3 (no date) 1901 AM1 Indochina
Laotians AM8

"Pa-Niang," formed of slices from a large fish which have been smoked. 226

"Pa-Heng," or a small dried fish. 262

"Pa-Khem" corresponds fairly closely to our salted and dried fish of the sardine type known as Nantes, which are left in salt for only a few days.

Finally, "Pa-Dek" is the form in which most of the large varieties of fish are preserved, and is an almost indispensable part of the native food supply. To prepare Pa-Dek the meat is cut into small pieces and ground in a mortar with salt and pepper so as to produce a kind of paste which is then put in jars with salt. The resulting brine helps to preserve the product (1). 263

(1) The price of Pa-Dek varies between 18 and 25 francs per hundred kilograms. This is the "Mam" of the Annamites.

The price of fish is subject to fluctuations, depending on the scarcity of it. The large fish of which we have just been speaking sell at prices between one and forty francs, depending on their weight and their abundance on the market. 226 435

Eels, shrimp of the prawn type and crabs are also found in the ponds and rivers of Laos during the rainy season, and in the water-courses there are various edible shellfish [358] such as the river mussel and small winkle. The ponds and swamps shelter several varieties of frogs, some of which reach an enormous size. All of them are edible, and are caught with a red ribbon on the end of a line fastened to a long bamboo pole. 226 [227]

II

PRESENT-DAY CROPS

Together with an enumeration of the crops grown in Laos we should like to be able to give the area which each occupies and the cultivable surfaces with the nature of the soil and the type of crops which would be suited to them, but as the Superior Resident states in his report for 1899: 241 311

"We have been in the colony for too short a time to have been able to set up a cadastral registry service. In view of the large area of the territory (267,000 square kilometers), the small and sparse population which inhabits it (2,7 inhabitants per square kilometer in

249 is that grown in the regions which we have just mentioned. Because of its origin and the name of the two main distribution markets of the trade, it is called Nong-Khay or Vien-Tiane tobacco.

We do not have exact data on the annual production of tobacco in Laos, because of the excessive fragmentation of the plantings and the absence of a crop registry. But information gained from commercial statistics enables us to say that in 1898 exports from the Paklay-Pone-Pissay region reached more than 42 tons. Also, if we attribute to each [276] inhabitant two grams of tobacco per day (this is not an excessive figure) or ten grams per family of five, we find that total consumption in Laos would be from 340 to 345 tons annually, or a total production of about four hundred tons (1).

(1) See Appendix XXIII.

[435 439] The export sale price varies from fifty to a hundred francs per hundred kilograms, depending on the quality.

248 COTTON. Cotton, a herbaceous and annual plant, is cultivated 439 almost everywhere in Laos for local consumption, and particularly in northern Laos for export to Yunnan. In fact, this product is almost the only return cargo for the mule and horse caravans which come in each year from Yunnan-Fou, Tali, S'semao, etc. with tea, furs, iron and copper pots, knick-knacks, etc.

248 The farming methods in northern Laos are as follows. Seeds are placed in pairs in holes which are about ten centimeters deep and spaced at varying distances depending on the region. Stony ground is preferred, on which the brush has been burned away both to clear the land and also [362] to fertilize the soil. No other fertilizer is used except the ashes of the vegetation which covered it.

The seeds are sowed in April or May and usually germinate a few days later. The plantings are harrowed and weeded twice each season, and harvesting is usually finished in November. The cotton is of a mediocre quality, with short staples, but despite this defect it is highly sought-after, as we have seen above, by the Chinese caravans which buy all of the available supply each year at the chief local markets. The height of the plant at full yield does not exceed sixty centimeters, and the yield per kilogram of bolls averages thirty percent or about 300 grams.

248 In southern Laos the cotton fields are small in extent, widely 311 scattered and formed chiefly of narrow strips of alluvial terrain on the

banks of the Mekong and its larger tributaries. 248

It is also grown on former rais in the highlands of southern Laos. 311

The climate of the Mekong valley is essentially favorable to the production of cotton, but the extent of the plantings has so far been limited, because of the lack of outlets, to what is strictly necessary to satisfy current local consumption.

Farming methods, in the lowlands of Lower Laos as well as in the highlands, are extremely primitive. The brush is cleared from the piece of land chosen, then without either weeding or fertilization the seeds are sowed in holes made with a dibble. 248

Two varieties are grown:

1. The large-flowered variety (Fai-Dok-Niai), which is preferred as being more productive and having fewer seeds. It is sowed at the end of the rainy season, usually in October, and harvested in March. This variety is cultivated only on the banks of watercourses. Its average height is one meter.

2. The small-flowered variety (Fai-Dok-Noi). It is cultivated only on higher ground, on former rais or in mountainous regions and is similar to the variety found in northern Laos. [363] It is sowed and harvested at about the same times as the above, that is to say from May to July for sowing and November or December for harvesting. Its average height is .7 meter.

It is difficult to determine the yield per hectare, in view of the fact that the cotton fields are irregular and variable in shape and size. On the basis of results in a certain number of fields which were measured separately, however, we may hazard the approximate figure of 200 to 400 kilograms of raw cotton per hectare, depending on the type of soil and its disposition.

On-the-spot purchase prices vary appreciably between the two parts of Laos. In the northern part, for example, the second-grade cotton bought by the Chinese sells for 35 to 40 francs per hundred kilograms. [435]

This crop should be developed further, and in a later paragraph we shall outline the steps which might be taken (1).

(1) Based on the reports of the Superior Commandants of Upper and Lower Laos. [113]

SUGAR CANE. Sugar cane is cultivated everywhere, both in the hills and on the low prairies. It is used only for local consumption, 249

249 either in the natural state or in the form of black, pasty, molasses-laden sugar.

There are several varieties, the chief of which are the heavy, green cane which is highly cellulated, and the small violet-colored cane with joints closer together, which is fuller than the first.

Farming methods do not differ from those used in other countries. Cuttings are planted, and the plants are topped if they show a marked propensity to excessive leafy growth.

257 To manufacture sugar, the cane is crushed between two vertical
407 cylinders driven by two wooden gears of a most ingenious construction. A buffalo turns the whole by means of a crossbar or shaft, the end of which is attached to its neck and constitutes a whim. Sometimes the cane is crushed between two pieces of stone or hardwood, one of which rests on the ground while the other [364] is applied on top of it by means of a wooden lever. One or several persons work the other end of the lever with all their weight and move it up and down in a series of
[439 jerky motions. The juice extracted from the cane is placed in large
415] cast iron cauldrons shaped like cupels, which are imported by Chinese merchants. Condensation takes place over an open fire laid in primitive hearths which are cut into the ground itself, if it is clayey. When the syrup reaches the desired degree of thickness the whole mass is poured into rectangular or circular molds made of wood or bamboo. After cooling the loaves of sugar which come from the molds, and which are from three to six centimeters thick, are wrapped in dry leaves. They are transported and sold in this form. The cane itself is called "Oi" and the sugar "Nam-Oi" or, literally, water of cane.

[276 The Laotians do not refine alcohol from the juice of sugar cane,
101] and are even ignorant of the initial refining stage which the Annamites use and which produces brown sugar.

[435] The price of sugar on the markets of Laos varies from one point to another, and transactions involve small quantities only. Statistics do give evidence, however, from which market prices of 35 to 50 *francs per hundred kilograms can be deduced.*

249 INDIGO. We have seen above that the Laotians use the indigo-bearing properties of certain plants which grow wild in the forests in order to dye cloth goods blue. They also produce a variety of indigo, the Indigofera tinctoria, which is similar to the variety found in Bengal. The plant itself is called "Kok-Kame" and the extract or dye "Nam-Kame

248 There are three harvests each year. In the first the shoots are .9 meter high, in the second 1.4 meters and in the third 1.6 meters. They yield, respectively, for an area of 14 square meters, 18, 20 and 24 kilograms of fiber.

At harvest time the shrub is split and left to soak in water for three hours, for the fiber is difficult to tear off. The work of decortication takes a long time, and this drawback has so far prevented the cultivation of this crop from spreading although it is an easy one on the whole and not at all exhausting for the soil, since it is possible to grow it twenty years in succession on the same plot of ground.

438 Exports from the provinces of southern Laos were more than fifty
248 tons in 1899. A great deal is used locally, since all the nets used for hunting and fishing are made with this fiber.

Prices are as follows (1):

248 (1) In view of the price at Bassac (37 francs), it would be ad-
435 vantageous to export this product to Cambodia, where it sells for twice as much.

	Per hundred kilograms
Plateau of the Bolovens	25 to 35 francs
Bassac	37 "
Saravane	60 "
Khong	60 to 80 "
Attopeu	30 "
Stung-Treng	54 to 62 "
Pnom-Penh	60 to 80 "

248 [367] HEMP. Hemp is grown in Upper Laos, but only for local consumption. It is used in making string, light rope, nets, etc. A very strong and fairly good-tasting alcohol is also extracted from its seeds. It is called "Pane" or "Nhia-Pane."

241 BATATAS. Various kinds of batatas which are more or less sweet
[262] are grown each year on the banks of the watercourses and in the still
[231] moist sandy alluvia. These tubercles are chiefly consumed by the inhabitants, although small quantities are used to fatten certain animals, particularly pigs. The large variety of batata which is round and not very sweet is called "Mane-Phao" and the one which is elongated and sweeter is called "Mane-Keo."

245 Here, as a sample, is a table showing cardamom production on the
435 plateau of the Bolovens during the last few years, with purchase and sale prices:

Year	Production in kilograms	Price per hundred kilograms	
		On the plateau	At Pnom-Penh
		Purchase	Sale
		francs	francs
1895	120,000	37.50 to 50	66.20 to 85.60
1896	48,000 to 60,000	50 to 58.30	70 to 93
1897	96,000 to 108,000	50 to 62.50	77.80 to 97.30
1898	270,000	50 to 66.60	85.60 to 136.
1899	216,000	54.10 to 75	77.80 to 136

249 [375] MULBERRY TREES. There are two kinds of mulberry trees
231 for feeding silkworms in Laos: the annual mulberry and the shrub or perennial mulberry (1). In Laotian the latter is called "Kok-Mone,"

(1) It is no doubt to be identified with the multicauline mulberry and the white or Chinese mulberry.

[311] which may be translated literally as silkworm tree.

The mulberry is grown near villages, on the banks of watercourses. Oftentimes the foot of an arborescent mulberry will even be inundated during the rainy season, and it has been noted that the worms which devour the leaves of these trees are more subject than other worms to the diseases of the species and produce less silk. It is therefore probabl that excess humidity is harmful to the mulberry. But if at the present time most of these shrubs are planted in humid regions, this is due to the fact that in many places the higher ground has been abandoned and the inhabitants have settled in the bottoms of valleys. It will be understood that the natives like to have the gardens of mulberry trees

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289 The amount of paper produced is hardly significant, and is limited to local needs.

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311 TEA. Tea is the most important crop of the Sib-Song-Pahn-Na and the Burmo-Shan States on both banks of the Mekong. The regions of production are included between 21° 30' and 22° 30' N. latitude and between 97° 30' and 99° 40' E. longitude.

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648 The greater part of these regions, that is to say those situated on the left bank of the Mekong, belonged to us by the terms of the 1887 Franco-Chinese treaty of Tien-Tsin. But because of our slowness to occupy these territories England inherited the rights of Upper Burma and ceded them to China, and finally only the two Muong-Hou remained in our possession.

563 Unfortunately, the small tea-growing region left to us is not only the least productive, but also the one in which tea-growing has degenerated and is no longer practiced except by the Khas.

[377] Yet the climate of the Muong-Hou is similar to that of Man-La, which is located thirty kilometers to the west and whose tea has the same reputation as those of I-Hou, I-Bang, Muong-Hing, Muong-Pang and Muong-Yang, all of which are known as "S'semao and Pou-Eurl Teas." Furthermore, the altitude and configuration of the soil, the nature of the terrain and the varieties of tea plants are all similar in our territory of Muong-Hou and in that of Man-La. But as a consequence of various circumstances and especially of a long interruption in cultivation between 1884 and 1893, most of the tea plants have not been pruned. They have reached a height of more than six meters and the tea which they produce is almost valueless (1).

(1) See Appendix XXVI.

The average production of the whole tea-growing region has been estimated at from 600 to 660 tons. This tea is exported to China, to Burma, to Laos, to Tonkin and to Siam. In 1891 and 1892 France imported a trial shipment of 6,000 kilograms, but the transaction was not repeated because of a rise in transport costs and customs duties which did not leave a large enough profit for the importer.

435 In the regions of production prices vary, depending on quality, between 75 and 150 francs per hundred kilograms.

The teas which come from this region meet with little approval in Europe, because they lack the various aromas which the Chinese

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selected seed to the natives, and by giving them advice and, if necessary, orders.

The reader will doubtless be struck by the fact that we shall often reiterate, in speaking of the crops which should be encouraged or introduced, that the administration's role should be to make trials of such and such a plant. This is nevertheless the case. It must not be imagined that individual initiative will suffice, for the comparatively large capital investment which any agricultural enterprise requires will not be made until after any given crop has proved to be successful. It is therefore incumbent on the administration to make these first trials. Was it not the Government which set up the first plantations of tea in Assam, of cinchona in Java, and of tobacco and coffee in Sumatra? The colonists did not come until later, when the period of groping and failure was over, and they were then able to act with assurance almost everywhere.

Rice. The cultivation of glutinous rice should most particularly be developed in southern Laos, with a view towards the manufacture of alcohol.

We have seen above how small a proportion of the cultivable land has heretofore been utilized. Much land suitable for making ricefields has not yet been cleared. In spite of the remunerative price offered them for the produce of the soil, and in spite of the encouragement which they have received from all quarters, the natives do not yet understand all the advantages which they would gain from developing their crops. It is nevertheless easy to see that since our arrival in Laos the inhabitants have realized that the regime of terror and exactions has disappeared and that an era of prosperity and justice is opening up before them, and they are increasingly devoting themselves to the work of the fields. Ricefields have appreciably increased in extent, either because new land has been cleared or because abandoned fields have been brought back under cultivation.

Glutinous rice is assured of a certain and profitable sale on the markets of Cambodia and Cochinchina (1). It may be anticipated

(1) At the present time, with the existing means of transport, exporting rice from Bassac to Pnom-Penh yields an average net profit of 13 francs per ton.

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438 Chinese and Laotian middlemen and even the few European merchants--have found that it brings in rewarding profits. Indeed, by exporting this product the latter are assured of an almost certain gain of 20 to 30 percent.

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439 [387] Ramie. There is also much to be gained from increasing the production of ramie or Chinese nettle. It is assured of an outlet in Cambodia, where it sells for as much as 80 francs per hundred kilograms.

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185 Cinnamon. The extension of the plantations and gardens of cinnamon trees already in existence in the province of Vien-Tiane deserves serious encouragement. The bark of these trees is a valuable product which is much sought-after in China and in Europe.

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656 Opium poppies. The Government of Indo-China, which is both the preparer and seller of chandoo or opium for smoking, is the party which would gain most from obtaining the raw drug on French territory. It is, indeed, still dependent on British India for this product, and can acquire it only on extremely disadvantageous terms.

Since much time must still pass, however, before the Meos and the Yaos give up their age-old methods, it would be essential for the intensive cultivation of the opium poppy to be undertaken by Europeans on behalf of the administration. This would be possible if there were a guaranteed labor supply in the form of Chinese coolies, who would be enlisted primarily for the greater part of the work, and of native specialists who would deal only with scarification of the capsules, harvesting the opium and the first stage of its preparation.

These delicate operations are the ones which the Meos and the Yaos like best, but they dislike plowing, fertilizing, weeding and irrigation, all of which tasks are indispensable for obtaining a high yield of capsules and consequently of the raw drug. It would therefore be best to entrust this heavy work to foreign coolies, and it is probable that after a certain time they too would be capable of extracting the opium. Impelled by their example, the natives would doubtless then be seen to break with their prejudices and devote themselves also to intensive cultivation so as to reap its full benefits.

The role of the administration would then be at an end, and it would gradually diminish its intervention as free cultivation of the poppies increased.

[435 Raw opium which is produced locally or which comes from [388] neighboring countries is worth 22 francs, 50 centimes to 32 francs, 25 centimes per kilogram, depending on quality, in northern Laos.

centimes per kilogram, depending on quality, in northern Laos.

Betel nuts. It is a well-known fact that commerce in betel nuts is quite extensive in the Far East, since the number of consumers runs into several millions. It is therefore a crop to be developed and encouraged, all the more so because the climate, soil and temperature of Laos are perfectly suited to plantations of this type. 24 185 435

In Laos the harvest from about three trees sells for one tical (1 franc, 50 centimes). In Cochinchina the produce of a single tree is worth about one piaster (2 francs, 50 centimes). It is therefore evident that it would be profitable to export this nut in large quantities.

PRUNING AND GRAFTING FRUIT TREES. The natives in Laos, as a consequence of ignorance, lack of initiative, carelessness and also lack of the necessary means, do not give sufficient care to fruit trees. The result is that the latter, at least in the case of most varieties, bear only degenerate fruits. 24 185

It is to be desired that these trees should no longer be abandoned in this manner, without being pruned, trimmed or grafted. Thought might then be given not only to improving the natives' diet in the way of fruit, but perhaps also to creating new resources by preparing certain kinds of preserves, fruits with juice, compotes and jams.

Again it is the administration alone, with the means of action at its disposition and the authority in its possession, which could act in an effective manner.

The colonial and botanical gardens, etc., should be able to provide administrators with precise information on the care to be given to the various fruit trees, both in order to improve their fruit and to increase their yield.

The obvious middlemen between the administration and the population are the bonzes. The latter, if they were the possessors of industrial knowledge, would be listened to and imitated above all others when they provided an example by giving their care to the numerous varieties of fruit trees which they keep up within the enclosures of pagodas or nearby.

231 Attopeu; slopes of the plateau of the Bolovens; plains of the Se-Kampho and of the Se-Pien (2); plains of the upper Sebang-Khan and of the
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(2) I have never crossed these great and beautiful plains which stretch as far as the eye can see between these two rivers which have water all year long, intersected here and there by wooded hills whose slopes provide the herds with a refuge and with a guaranteed food supply during the inundation of the lowlands--an inundation lasting three or four months--without regretting that no European colonist has ever thought of taking advantage of this situation. (Report of the Superior Commandant of Lower Laos, April 1897.)

Ia-Drang.

231 The sale prices for buffalo and oxen vary from one point to another and are also subject to fluctuations due to the age, stature,
435 abundance or scarcity of the stock, the law of supply and demand, etc.

In 1899 livestock exports from Lower Laos only were 2,184 oxen valued at 54,600 francs, 362 cows valued at 5,430 francs and 3,144 buffalo valued at 235,800 francs, or a total of 6,690 head with a value of 295,830 francs.

In Lower Laos buffalo sold for from 50 to 112 francs in 1899, and oxen for from 20 to 30 francs. In Upper Laos the prices for [406] buffalo varied from 60 to 110 francs. Oxen may cost more or less there, depending on whether they are trained as draft and pack animals or fattened for export. In the first case they bring from 40 to 70 francs and in the second from 10 to 15 francs.

231 Pigs. Pigs are used mainly for food by the natives, who con-
262 sume a great many. The meat of this animal enjoys great favor among the population, and it is pork which, prepared either alone or with fish, enters most often into the composition of meals. [Illustration here]

[563] The Lus, the Meos, the Chinese and the Khas are past masters at raising pigs, and their stock might figure successfully in our regional competitions. They fatten them in closed compartments, after first castrating them.

231 The most common variety is the one known as "Cochinchinese or Tonkinese pig." It is gray with white spots and sometimes almost black, and bears on its back a mane of long, stiff bristles similar to those of the wild boar. Even when domesticated these pigs have

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435 The following table shows the considerable discrepancy between purchase prices within the country and sale prices on transit and European markets.

In the last seven years Laos has become a French possession, but [505] the interior conditions of trade and exchange have not varied. A single modification has been the fruit of our occupation, the creation of a line of steam transport on the Mekong. This service, although still not perfect, nonetheless constitutes [427] [Illustration] [428] [Blank page] [429] the most economical route from Luang-Prabang or Nong-Khay to Cambodia and the sea. Unfortunately, the customs barrier is there to stop the products which our industries do not yet manufacture but which our merchants could import into Laos in competition against those brought in through Siam, Burma and Yunnan.

Markets	Sticklac per 100 kilograms	Benzoin per 100 kilograms	Cardamom per 100 kilograms	Rubber per 100 kilograms
	francs	francs	francs	francs
Hua-Pahn (Laos)				1st quality 166 to 208 2nd quality 85 to 115
Nong-Khay, Vien-Tiane (Laos)	50 to 60	150 to 250	55 to 60	1st quality 250 to 280
Bassac (Laos)	38 to 40		92 to 100	
Pnom-Penh and Cholen (Cambodia & Cochinchina)	54 to 70		133 to 165	1st quality 540 to 625
Korat (Siam)	75 to 95	250 to 280	85 to 110	
Bangkok (Siam)	125 to 135	300 to 350	140 to 180	
London (England)	220 to x	500 to 700	250 to 310	1st quality 750 to 835
Hamburg (Germany)				1st quality 800 to 1000 2nd quality 450 to 600

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A. MERCHANDISE

Total exports from Lower Laos during 1898

Name of merchandise	Average purchase price per picul of 60 kilograms	Average sale price at Pnom-Penh	Average sale price at Saigon	Number of piculs exported	Total value of purchases made in the country	Observations
Cardamom	22$00	32$00	40$00	4,675	102,850$00	including 829 piculs exported to the right bank
Decorticated rice	2.00	?	?	72	144.00	" 12 " id.
Paddy	0.40	1.80	2.20	12,469	4,987.60	" 408 " id.
Chinese nettle	9.00	14.00	?	904	8,136.00	" 115 " id.
Lac	9.00	15.00	?	228	2,052.00	" 22 " id.
Betel nuts	5.00	9.00	?	72	360.00	
Tamboyan	1.50	25.00	33.00	24	36.00	
Wax	60.00	85.00	90.00	94 1/2	5,670.00	" 24 1/2 " id.
Ivory	400.00	470.00	?	9 1/2	3,800.00	" 45 k. " id.
Elephant bones	4.00	6.00	7.00	2	8.00	
Tiger bones	16.00	23.00	24.00	1 1/2	24.00	
Pirogues (single units)	30.00	60.00	?	601	18,030.00	" 2 " id.
Hides and horns	11.00	17.00	22.00	2,814	30,954.00	" 51 " id.
			Totals	21,365 1/2 piculs and 601 pirogues	177,051$60	

[434]

B) MERCHANDISE

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Total exports from Lower Laos during 1899

Name of merchandise	Average purchase price in piasters per picul of 60 kilograms	Quantities exported		Total value of purchases made in the country
		piculs	kilograms	
Pimento	9	4	240	36$
Cotton	3 to 4.50	4	240	16
Ginger	3	2.12	132	7
Tobacco	18 to 24	2.80	168	60
Basketry	Unit price 1	40 baskets		40
Elephant fat	5		13	1.20
Anteater hides	11 to 12	11 2/3	690.30	136.20
Tiger pelts	4 to 7 apiece	one		6.60
Monkey hides	20	1 1/2	90	30
Lime	0.50 to 0.60	150	9,000	82
Domestic cotton goods	0.10 per meter	80 meters		8
Tortoise shell	9	2	120	18
Anteater scales	12	1/2	30	6
Tin	36	75	4,500	2,700
Buffalo horns	7 to 12	403 2/3	5,912.40	3,412
Ox horns	7 to 11	21	1,260	228
Buffalo hides	8 to 12	576	34,631	6,422
Ox hides	10 to 14	417	12,137.80	5,035
Wax	60 to 80	102 1/2	6,141.80	7,804.50
Cardamom	12 to 23	4,451	267,117.70	84,089
Ivory	180 to 400	6	353	2,065.78
Buckskin	9 to 20	638	38,260	9,305
Gum lac	9 to 11	244 1/3	14,669.80	2,439
Rhinoceros hides	17	5 1/2	321	93
Palm fibers	3	6	360	18
Chinese medicine	15	9	540	135
Gold dust	unit price in ticals	12$70	21 ticals	268
Elephant bones	3	2.10	130	6.50
Tiger bones	15 to 18	2 1/6	130	35.30
Betel nuts	9 to 10	3	180	29
Chinese nettle	7 to 20	706.50	50,242	10,607.87

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Total exports from Lower Laos during 1899 (cont.)

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Pirogues	Depending on size	number	552	22,076
Hartshorn	9 to 15	194	11,630	2,577.20
Soft hartshorn	200		24	112
Rhinoceros horns	About 55 per kilogram		38.500	2,118
Spun silk	120	3	180	360
		General total		162,383$15

149: Reinach--323 G-3 (no date) 1901 AM1 Indochina Laotians AM8

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A) ANIMALS
Total exports from Lower Laos during 1898

Kind	Average purchase price of animal	Average sale price outside Lower Laos	Number of animals exported	Total value of animals exported. Average purchase price in country	Total value of animals exported. Average sale price	Observations
Elephants	350$	1,200$	192	67,200$	230,400$ (1)	(1) Prices offered in teak yards along the Menam.
Horses	20	45	103	2,060	4,635	
Buffalo	20	36	4,721	94,420	169,956	
Steers	9	20	1,056	9,504	21,120	
Pigs	3	6	500	1,500	3,000	
		Totals	6,572	174,684$	429,111$	

149: Reinach--324 G-3 (no date) 1901 AM1 Indochina Laotians AM8

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B) ANIMALS

Total exports from Lower Laos during 1899

Kind	Average purchase price of animal	Average sale price outside Laos	Number of animals exported	Total value of animals exported. Average purchase price in country	Total value of animals exported. Average sale price	Observations
Pigs	2 to 4$	4 to 8$	6,038	12,226$	24,452$	
Steers	8 to 12	10 to 24	2,184	21,840	43,680	
Cows	4.80 to 8	6 to 10	362	2,172	2,896	
Buffalo	20 to 45	35 to 80	3,144	94,320	157,200	
Horses	12 to 50	35 to 90	185	5,550	11,100	
Mares	12 to 30	16 to 38	14	280	400	
Elephants	300 to 450	12 to 1600	115	40,300	172,200	
		Totals	12,042	176,688$	411,928$	

149: Reinach--325 G-3 (no date) 1901 AM1 Indochina Laotians AM8

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II UPPER LAOS

Total exports from Upper Laos during 1898

Name of article	Average purchase price in country, in piculs	Average sale price in nearby countries	Number of piculs or units exported	Value of purchases made in country	Observations
A. From Luang-Prabang (various merchandise)					
	$	$	piculs	$	
Cardamom (piculs)	18.00	27.00	150	2,700.00	All to the right bank.
Benzoin "	54.00	68.00	500	27,000.00	
Lac "	10.00	14.00	2,000	20,000.00	
Wax "	54.00	60.00	20	1,080.00	
Resin "	2.00	3.50	10	20.00	
Ramie "	18.00	21.00	50	900.00	
Raw silk "	125.00	150.00	45	5,625.00	
Hemp "	18.00	21.00	15	270.00	
Mats, per hundred	9.00	15.00	18,000 u	1,620.00	
Scarves and skirts	Variable		900 u	3,500.00	
Rhinoceros horns (piculs)	2,000.00	2,500.00	1	2,000.00	
Ivory "	360.00	430.00	3	1,080.00	
Horns "	7.00	9.00	40	280.00	
Hartshorn "	10.00	14.00	10	100.00	
Soft hartshorn "	2,500.00	3,000.00	1 1/2	3,[illegible].00	

149: Reinach--328 G-3 (no date) 1901 AM1 Indochina Laotians AM8

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Total exports from Upper Laos during 1898 (continued)

Name of article	Average purchase price in country, in piculs	Average sale price in nearby countries	Number of piculs or units exported	Value of purchases made in country	Observations
Anteater scales (piculs)	32.50	45.00	58	1,885.00	
Tobacco "	8.00	12.00	150	1,200.00	
Animal remains "	8.00	11.00	700	5,600.00	
Miscellaneous (pottery and forest products)				8,500.00	
				87,160.00	
		B. From the other commissionerships			
Approximate total			3,000 piculs	50,000$00	
		C. Miscellaneous animals			
Steers	7.00	12.00	300 head	2,100$00	Epizootic disease halted this trade.
Buffalo	10.00	20.00	700 "	7,000.00	
			1,000 head		
Upper Laos ..... Grand Total			7,553 1/2 piculs	146,260$00	

489 [447] Current transport costs are generally as follows:

Land Routes	francs
435 By human bearer, per hundred kilograms and per day:	1.90 to 2
439 By elephant, " " " " " "	1.60 to 1.80
By pack-horse, " " " " " "	1.90 to 2
By pack-ox, " " " " " "	0.70 to 0.80

By referring to what has been said above, we may deduce, for each of these methods of transport, the following average cost per ton or per kilometer:

By human bearer: 0.76 to 0.80 francs
By elephant: 1.07 to 1.20 "
By pack-horse: 0.76 to 0.80 "
By pack-ox: 0.70 to 0.80 "

Boatmen. Boatmen may be hired by the day or by contract for a given journey. The current prices are 0.375 franc per man per day without rice, and 0.30 franc with food.

Coolie bearers. Coolie bearers are generally paid 0.25 franc per man and per day without food, or 0.20 franc with rice.

Chief coolies and chief pirogue boatmen. The chief coolies and chief pirogue boatmen, pilots, etc. are always paid higher than their men. The amount of increase will vary, depending on conditions, by fifty to a hundred percent.

Pirogue rental. Renting a pirogue usually costs the same price per day as hiring a boatman. Thus the cost of renting a pirogue and hiring four boatmen is reckoned on the basis of five units.

B) Comparative transport costs on various trade routes from Laos to the sea.

We have thought that it might be of interest to sum up, in the comparative table given below, the courses and costs per ton and per kilometer of transports on ten of the principal trade routes of Laos.

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[448] COMPARATIVE TABLE OF TRANSPORT COSTS ON VARIOUS TRADE ROUTES FROM LAOS TO COCHINCHINA, ANNAM, TONKIN AND SIAM (AND VICE VERSA)

Courses	Means of transport	Distance in kilometers	Number of days		Price in francs		Observations
			upstream	downstream	Total per metric ton of 1000 kilograms	Per ton and per kilometer (ton-kilometer)	
I. Luang-Prabang to Saigon	By River Merchant Fleet. Steamships and pirogues	2300	50-60	30-35	162.50	0.0705	The average rate for cotton goods is taken as a basis.
II. Nong-Khay to Saigon	Same	1840	27-35	18-22	122.25	0.0664	Same.
III. Nong-Khay to Bangkok by way of Korat	Oxcarts	603	34 to 36		260 to 300	0.414 to 0.497	On this route prices vary from one year to the next, depending on the abundance of draft oxen, which are often decimated by epizootic disease.

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COMPARATIVE TABLE OF TRANSPORT COSTS ON VARIOUS TRADE ROUTES FROM LAOS TO COCHINCHINA, ANNAM, TONKIN AND SIAM (AND VICE VERSA) [continued]

III. (continued)							In case of a rise, the prices given here should be increased by about 15 percent.
IV. Luang-Prabang to Nong-Khay	1. By River Merchant Fleet. Pirogues and rafts.	460	15 - 25	10 - 12	40	0.0861	The average rate for cotton goods is taken as a basis. Usual prices, whatever the merchandise.
	2. By free rafts. Upstream by pirogue.		18 - 25	9 -12	250	0.543	
V. Nong-Khay to Pak-Hin-Boun	1. By River Merchant Fleet. Steamships.	335	2	1-1/2	22.50	0.0673	Average rate for cotton goods taken as basis. Usual prices, for all merchandise.
	2. By rafts and free pirogues.		8-14	4-5	100	0.298	

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COMPARATIVE TABLE OF TRANSPORT COSTS ON VARIOUS TRADE ROUTES FROM LAOS TO COCHINCHINA, ANNAM, TONKIN AND SIAM (AND VICE VERSA) [continued]

VI. Pak-Hin-Boun to Haiphong via Ben-Thuy (Annam	By pirogue, elephant, sampan and steamships belonging to the Correspondances fluviales du Tonkin.	570	15-17	15-16	130 to 150	0.228 to 0.263	By pirogue from Pak-Hin-Boun to Keng-Kiet. By elephant from Keng-Kiet to Hatrai (Annam). By sampan from Hatrai to Ben-Thuy. By steamship from Ben Thuy to Haiphong.

149: Reinach--340 G-8 (no date) 1901 AMI Indochine
Laotian AMS

149: Reinach--341 G-3 (no date) 1901 AM1 Indochina
Laotiam AM8

(A49) COMPARATIVE TABLE OF TRANSPORT COSTS ON VARIOUS TYPES RATES FROM LAOS TO COCHINCHINA, ANNAM, TONKIN AND SIAM (AND VICE VERSA) (continued)

Courses	Means of Transport	Distance in kilometers	Number of days up-stream	Number of days down-stream	Price in Tical-Ticals per ton of 1000 kilograms	Pence per ton and per kilometer (ton-kilometer)	Observations
VII. Luang-Prabang to Haiphong via Nong-Khay and Nam-Thay (Yunn).	1. By River Merchant Fleet, pirogues and steamships. By elephant, pirogue and compan. By steamships belonging to the Compagnie Fluviale du Yunnan.	1115	35-42	28-31	198.50 to 212.50	0.173 to 0.190	By pirogues, rafts and steamships of the River Merchant Fleet from Luang-Prabang to Nam-Houm. The rest as above.
	2. By rafts or free pirogues. By elephant and compan. By steamships belonging to the Compagnie Fluviale du Yunnan.	1115	40-48	33-35	480 to 500	0.43 to 0.448	By rafts and free pirogues from Luang-Prabang to Nam-Houm. As above for the rest of the journey.
VIII. Luang-Prabang to Bangkok. 1st section. Luang-Prabang to Pak-Lay	1. Pirogues, half-loaded going upstream.	230	13-17	4-7	36	0.156	After all three sections, the total price per ton and per kilometer only 1,090 kilometers.
	2. Rafts going downstream.				18	0.078	
2nd section. Pak-Lay to Thkit (Ostaredit)	1. By elephant, horse and ox in both directions.	220	7-9	10	180	0.818	
	2. By human bearer, in both directions		20-22	23			
3rd section. Thkit to Bangkok (Siam).	1. Pirogues, fully loaded, towed by steamships going upstream (August to October inclusive).	600	23-24	4	54.16	0.90	
	2. Pirogues, half-loaded going upstream (November to February).		30-34	—	96	0.160	
	3. Pirogues, fully loaded going downstream.		—	8	50	0.0878	
		1090	Average		Upstream: 366.16 Downstream: 249	0.349 0.236	Towards Luang-Prabang Towards Bangkok

[Table continued over]

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II. Routes to Bangkok via Oubone and Korat.	1. Steamship from Bangkok to Pakin.							
	2. Carts from Pakin to Oubone.	750	36	36	(26.65 245 19)	290.65	0.388	
	3. Pirogues from Oubone to Korat.							
I. Routes to Saigon.	Pirogue and steamship.	1110	14	30	57.20		0.0515	

439 489 435 [450] A mere glance at the table is enough to show the enormous difference between transport costs towards Siam, and those towards Annam, Tonkin and Cochinchina. And even so, we have not reckoned with the various interior local taxes which shippers have to pay on the roads of Siam, nor evaluated the worries and bothers to which they are subject or the robberies which they must fear.

[Illustration here]

We have already expressed the opinion that if these routes continue to win favor with merchants, this is because they end at points and at markets where the latter can be sure not only of marketing their products, but also of finding at low prices all the merchandise, no matter what its source, which is necessary to the inhabitants of Laos.

Let our markets in Cochinchina, Cambodia, Annam and Tonkin be supplied in the same way and offer the merchants of Laos the same advantages in the way of reduced prices; let trading posts or factories be established on the Mekong at Stung-Treng, [451] Bassac, Lakhone, Hin-Boun, Vien-Tiane, Pak-Lay and Luang-Prabang, and the roads leading to Siam will rapidly be forsaken for our own. Indeed, all the merchants know that security now reigns in Laos. One pays what is due only once, the distances are shorter, and transport costs are lower than those paid from the Mekong to Siam.

7. CUSTOMS SYSTEM TO BE ADOPTED

439 65 The valley of the Mekong, of which we occupy one side, remains open in fact whereas the coasts of Indo-China are closed by the customs. If we were to close this valley as well by a customs barrier we should then have contracted enormous expenditures without any hope of compensating receipts. From still another point of view, is it not to be feared that the present state of things will bring about the following result? Today, foreign merchandise is halted on our coasts by customs duties. Since such merchandise is, moreover, indispensable to our nationals, there can be no doubt but that it is coming into our possessions by a back door, despite the long distances, the high costs and the difficulties of all kinds which the roads from Siam to the Mekong offer. After flooding this basin first, it will penetrate into Cambodia, Annam and Tonkin without any profit either for the Treasury or for our nationals.

We speak in the future tense, but who can deny that we might

396 is also cut out with a hatchet so as to decrease the thickness of the walls and render them more elastic.

When the pirogue is as wide as is desired, or else as wide as the wood being used will allow without any danger of splitting or bursting, strong rectangular crossbraces are set at regular intervals and tailed into the sides of the pirogues a few centimeters below the gunwales. When it has reached this state the pirogue is virtually finished. It has its final shape, and looks like the elongated half of a fish which has been split lengthwise.

All that remains is to finish the work by giving the bottom and sides the requisite thickness, by polishing the wood, smoothing the curves, etc.

Finally comes the moment of launching. It must be said, to the honor of the builders' sure eye and skill, that it is always successful and that once put into water the pirogue behaves well in its element, with a light and graceful balance.

396 439 435 The price of pirogues varies depending on their dimensions and [466] the region, and can therefore not be fixed in any absolute fashion. A new pirogue, in fact, costs from 50 to 300 francs. In Cambodia a pirogue from Laos costs twice what it cost in its land of origin. Thus it may readily be imagined that pirogues are exported from Lower Laos in fairly large numbers. The statistics for 1899 show exports of 552 pirogues of various dimensions, with a [Illustration here] total value of 55,195 francs, or an average purchase price of 100 francs apiece.

398 Cartwrights. The construction of carts, wagons, pack-saddles for oxen and elephant palanquins is a specialized industry only on the right bank and in Siam. In French Laos carts are little used because of the nature of the terrain, and there are no cartwrights. Pack-saddles for oxen and elephant palanquins are made by nearly everyone, particularly by drovers and carnacs.

317 Lime. Lime is made in Laos, primarily for inclusion in betel masticatories.

276 [467] The kilns are dug in the clay on banks of watercourses, near calcareous masses from which limestone is taken.

272 Alcohol. The distillation of grain--rice, maize and hemp-seed--is not an industry in the strict sense, for every village and every family makes alcohol on occasion.

693 than of the rights of the parties. Our administration is making praiseworthy efforts to halt these abuses. Those who sell justice in this way are removed from their posts, and it is to be hoped that within a few years' time most, if not all, of the Laotian judges will be upright and disinterested. As a means toward stopping these deplorable habits and informing the parties in lawsuits of the legal costs which they will regularly be asked to pay, Lieutenant-colonel Tournier took a very useful first step in April 1898, by setting up a schedule of court costs in accordance with the laws and customs of Vien-Tiane (1).

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(1) The following, for example, are the court costs to be paid in a case of theft of domesticated animals:

Legal costs.....	15.00 francs	to be paid by each accused person.
Clerk.....	3.75 "	
Archivist.....	2.25 "	
Court roll.....	1.50 "	
Prison costs.....	11.25 "	

The legal costs are divided as follows:

Tiao-Muong.....	5.00 francs	15 francs.
Oupahat.....	2.50 "	
Judge hearing the case..	7.50 "	

The prison costs are divided as follows:

Jailer.....	5.00 francs	11.25 francs.
Upkeep for food for prisoners whom their families cannot feed or who do not work outside.....	6.25 "	
Lighting and upkeep of prison.....		

It goes without saying that, in addition to court costs, the guilty parties are liable to a fine, which, in the present case, would be 24 francs per person.

[490]

4. THE TAX STRUCTURE

a. Direct taxes

651 659 The direct taxes include the head tax, the optional redemption of statute labor and the licenses for Foreign Oriental merchants.

A census taken before the end of each year by the native authorities and checked by the administrators who are heads of provinces makes

316 Pou-Khao-Tong.

The gold is found in fine gravel including miscellaneous rock debris which has been covered by the recent alluvia of the water-courses, at a depth varying from a few decimeters to a meter and a half.

In 1899, as samples resulting from trial prospecting, we provided the local organizing committee for the Exposition of 1900 with gold, with black schlichs, with untreated gold-bearing gravel and with superposed sterile alluvia.

The fifteen and a half grams (15-1/2 grams) of gold in the form of grains and dust which was supplied represented the supervised production of a single gold-washer, in visible gold, for thirty days work at the rate of 20 wash-troughs per day which weighed 3.5 kilograms each on the average.

The gold content of the black schlichs which resulted from the washing and which we collected can be determined only by analysis (1).

(1) They were sent for analysis to the Saigon laboratory, but the results have not yet been published.

On the average, a ton of treated gravel represented a weight of about 300 grams of black schlichs, and a volume of 113 cubic centimeters.

Thus, with the rudimentary methods used in this prospecting operation, without amalgamation and despite the inevitable losses, the fifteen and a half grams of gold collected, using local procedures and labor, cost 30 francs, or 1.935 francs per gram and 1,935 francs per kilogram (2).

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(2) Here, by way of comparison, are the cost prices of gold at several points of the globe:

Saint-Elie (French Guiana), 1619 francs
Siberia 2170 francs
California, 1500 to 1700 francs
Australia, 1600 to 1900 francs

This, of course, by using the most advanced methods which reduce losses of the precious metal to almost nothing.

The respective densities of the schlichs, of the gold-bearing gravels and of the sterile alluvia [129] were 2.6 for the schlichs, 1.82 for the gravels and 1.49 for the sterile alluvia.

654 What is more, according to the economic report for the months of February and March 1900 in Upper Laos, which has just reached the 314 Indo-China Department of Agriculture and Commerce, 3,250 kilo- grams of rubber were exported during this period, or, to be precise, 439 this was the verified figure at Vien-Tiane. The storehouses in this center also contained a large supply which would probably go down- river at the first rises of the Mekong. [139] The sale price by natives 435 at Vien-Tiane was said to be one piaster per kilogram.

Tran-ninh, which had not yet been able to supply any statistics, even approximate ones, indicated exports of 1,500 kilograms to Tonkin for the same period and at the same price as being the amount of export rubber which represented purchases from Vien-Tiane.

These prices, which are reasonable ones in view of the present value of money in Laos and the needs of the inhabitants, leaves the exporters sufficient profits. On the other hand, we have had occasion to note the entirely abnormal price of 5.50 francs per kilogram which rubber reached at Vinh towards the end of March 1900, a price which, when the cost of freight, transhipment and handling, insurance and losses in weight along the way is added, leaves only a small profit for the export trade.

IV

314 339,400 kilograms of rubber were exported from Indo-China 439 during 1900, as against 52,813 in 1899. Of this amount, 300,400 kilograms went out through Tonkin, and 39,000 kilograms through Saigon. The greater part of this rubber comes from Annam, and especially from Tran-Ninh (Laos).

By these figures we see how greatly the rubber trade has grown in Indo-China, and what a factor this raw material promises to be in the economic development of the colony.

The sale price in 1899 was one piaster per kilogram. Since that time it has risen appreciably in consequence of a rising demand from all quarters. In the province of Vien-Tiane the average price is two piasters per kilogram, and in the forests where the rubber is grown it costs 90 piasters per picul.

314 The rapid rise in the price of rubber has encouraged the natives to engage in excessive exploitation of the product, and without any care for the future they have destroyed large quantities of extremely productive lianas. The Laotians do not know how to collect the sap of the rubber plant and still spare the plant itself, and they thereby